viewer 600 includes an application launching means 602, a viewer means 604, an edit disabling means 606, a verification means 608, and a printing means 610. The application launching means 602 launches an application compatible with a file format of a version of the digital data 200. A viewer means 604 generates information concerning the universal signature object 100 for display to a user of a USO 100. The information concerning the universal signature object 100 could include, for example, a list of items contained within the universal signature object, such as each of the versions of the digital data 200, the number of signatories, the names of each of the signatories, the timestamp information, whether or not public keys have provided for each of the signatories, the use-permission information, whether a USO viewer 600 has been included with the USO 100, and/or whether a signing program 400 has been included with USO 100. The viewer means can also provide for display of a digital signature's verification results. In an embodiment, the viewer means 604 could be a word processor or a graphical display to display any and all of the aforementioned information concerning the USO 100.

[0058]   The application launching means 602 uses the information 106 concerning an application compatible with a version of the digital data to find and launch an application compatible with the version. As depicted in Figure 7, the application launching means may search the computer system 300 on which it operates to locate an application 722A compatible with one of the versions. Alternatively, the application launching means 602 may search a network via network connection 308 for an application 722B compatible with one of the versions. In yet another embodiment, the universal signature object 100 contains, as part of the information 106 concerning an application compatible with a version of the digital data, an executable version of an application 722C capable of utilizing one of the versions of the digital data 200. If a version of the digital data 200 is, itself, an executable file, the application launching means 602 launches one of the versions of the data 200 from the USO 100. In one embodiment, the application 722A, 722B, or 722C is embedded within an integrated user interface of the universal-signature-object viewer 600 or is otherwise under the control of the

universal-signature-object viewer 600. In another embodiment, the application 722A, 722B, or 722C is launched in separate user interface windows. If the format of a version, or formats of all of the versions, are unrecognizable or unknown to the signing program 400 when generating the USO 100, the USO 100 includes that the formats are unknown in the information 106 concerning an application compatible with a version of the digital data 106. The USO viewer 600, reading that the file formats are unknown, so notifies the user.

[0059] In an embodiment, the USO viewer 600 contains an edit disabling means 606 wherein the application launching means 602 launches an application and disables edit capabilities inherent in that application. In one embodiment, the edit disabling means is always utilized. In another embodiment, the application launching means 602 checks the use-permission to determine if the edit disabling means 606 should be employed. Continuing the business contract example, if the signatory 500 does not want any subsequent users of the USO 100 to edit the MS Word® version of the digital data (the first version of the data 200), when a subsequent user access the version, the application launching means 602 does not enable the edit functionality of MS Word® when it launches the application. Thus, the editing capabilities have been disabled and the document cannot be edited. This functionality can be applied to other version of the digital data 200 as well.

[0060] In an embodiment, a verification means 608 verifies one or more of the digital signatures included in the universal signature object 100. In one embodiment, the verification means 608 uses the public key 204 of the signatory 500 to verify the digital signature. If the verification matches, that information will be provided through the viewer means 604 to the USO viewer user or also provided through the printing means 610, which will be described in more detail below. If the verification does not match, that information will likewise be provided to the user. If the public key was not provided with the universal signature object 100, the verification means can, through the computer system 300, search for and obtain a copy of the public key. For example, the verification service 230 or a public key directory can provide the

public key to the verification means 608 via the network connection 308. Alternatively the verification service 230 can be used to provide the latest public key 204 of the signatory 500 regardless of whether one was included in the universal signature object 100.

[0061] In yet another embodiment, the verification means 608 also checks a digital signature or the USO 100 against an archived copy stored at a transaction server 220. The verification means 608 accesses the archived copy by interfacing, through the network interface 306 and network connection 308, to the transaction server 220 that contains an archived copy of the digital signature and/or universal signature object 100. This second verification provides added security and assurances that the digital signature and/or the USO 100 have not been tampered with and are accurate.

[0062] In an embodiment, the USO viewer 600 includes a printing means 610. The printing means 610 prints any of the information accessed or displayed by the viewer means 604 as described previously. In an alternate embodiment, the printing means 610 can print a version of the digital data 200 or interface with an application and provide print versions through the use of that application. In another other embodiment, the printing means 610 digitally watermarks the print copies generated by it.

[0063] From the above description, it will be apparent that the invention disclosed herein provides a novel and advantageous systems and methods of binding one or more digital signatures to digital data, regardless of the file format of the versions of the digital data 200. The above description is included to illustrate the preferred embodiments and is not meant to limit the scope of the invention. The scope of the invention is to be limited only by the following claims. From the above discussion, many variations will be apparent to one skilled in the art that would yet be encompassed by the spirit and scope of the present invention.

What is claimed is: